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# **First- and second- generation design and engineering students: Experience, attainment and factors influencing them to attend university**

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## **Abstract**

Challenges for students who are ‘first in family’ to attend university have been discussed within widening participation discourse. However, in the UK, ‘first in family’ or first-generation students have frequently been conflated with those experiencing poverty or from lower socio-economic groups. This research integrated survey data with assessment data from final-year design and engineering students in a UK university to examine students’ attainment, the influences on why students decide to attend university, and students’ experiences during their degree programmes. Analysis of the data showed variations in the reasons for first- and second-generation students wanting to go to university, particularly a significant difference in the influence of parents. First-generation students described significantly less parental influence on the decision to attend university than second- or subsequent-generation students. Smaller differences in students’ experiences and attainment in university were also noted. While first-generation students reported differences in study habits, their attainment was, on average, marginally higher than that of their peers. Building on others’ theoretical work, which suggests the importance of social capital within higher education, this research highlights the difference in social influences both on university application and expectations of university for those with and without a family history of tertiary education. Further research is needed to explore, in larger samples, whether the social influences on an individual’s perception of higher education are in turn shaped by whether or not their parents attended university, and further, what impact this may have, not only on degree outcomes but on the broader benefits typically associated with graduate experience.

**Keywords:** Attainment; fair access; first in family; social capital; widening participation

## **Introduction**

As with many Organisation for Economic Co-operation and Development (OECD) member countries, higher education (HE) within the UK has moved from an élite system where around 6% of eighteen to twenty-one year olds pursued a university education in 1962, to a mass system with slightly under 50% of the same demographic attending in 2012 in England (OFFA 2013). For some time, therefore, there has been a clear aim to promote the opportunity of successful participation in HE for anyone who might benefit from it (HEFCE, 2015). However, international debate within the education literature has questioned how far this increase in numbers of students attending HE has actually led to a widening or diversifying of participation, particularly whether it supports those from typically under-represented groups (Dawson et al., 2013; Dorling, 2016; Osborne, 2003; O’Shea et al., 2016).

Since the 1944 UK Education Act, a plethora of policies have been introduced with the purpose of expanding HE. Widening participation (WP) is now a strategic priority for government (BIS, 2014) and has been echoed in the 2015 green paper proposal (BIS, 2015). Universities and colleges in England have a statutory obligation to develop policies and interventions to improve the participation and experiences of students from disadvantaged or

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under-represented backgrounds, therefore increasing the number of students who are ‘first in family’ or ‘first-generation’ students in HE. Through the regulatory powers of the Office for Fair Access (OFFA), all HE institutions in England wishing to charge tuition fees above the basic fee (whilst currently standing at £6,000 *per annum*, the majority of institutions charge the maximum fee of £9,000) must have an access agreement detailing how the institution intends to direct a proportion of their higher fee income to widen participation (OFFA, 2016). Government and university policies and interventions to widen participation in HE have concentrated on groups of students who are considered disadvantaged or underrepresented at an institutional and sector level. These include:

- Care leavers
- Some ethnic minorities
- Low socio-economic groups
- Students from low-participation neighbourhoods
- Young carers
- Mature students
- Students with disabilities
- Students studying part-time

Following the work of Bourdieu (1977) and Bourdieu and Passeron (1990), education, particularly university education, has been increasingly recognised and debated as a crucible for social capital. Social capital can be considered to be the social, cultural and symbolic assets which dominant classes accumulate and (re)produce amongst themselves. Baxter and Hughes (2000) have challenged the prevailing theoretical frameworks for understanding social capital: the work of Bourdieu has been criticised for *not* challenging gendered and racialised assumptions, for example. Nevertheless, ideas of social capital drawn from Bourdieu remain important for WP research (Archer et al., 2007; Burke, 2012; Loveday, 2015; O’Shea et al., 2016). Indeed, from a social capital perspective, as Archer and colleagues (2007, p. 221) argue, participation in HE becomes a ‘natural progression, a “non-choice” by middle-class students, and “not for the likes of us” by working-class students’. This paper contributes to these discussions of social capital by returning to ideas that focus on how power and privilege are transmitted *as* inheritance. Bourdieu argued that education has ‘merely strengthened or taken over from the traditional mechanisms such as the hereditary transmissions of economic capital, of a name or of capital in terms of social relationships’ (Bourdieu, 1977, p. 496).

Recognising the importance of social capital, students who come from families *without* a ‘hereditary transmission’ of HE, that is, without a tradition of attending university (referred to here as first-generation students, also known as ‘first in family’), are also seen as a potentially disadvantaged group of students and form an integral part of the discourse of WP (Thomas and Quinn, 2007). Intentionally, this paper does not provide a focus on all under-represented groups but gives consideration to students whose parents did not attend university.

By first-generation students, we mean that one or more parent/guardian has had no HE experience but that siblings/cousins may have. In defining our target group like this we are acknowledging both the significant impact parental/guardian education has on young people’s attitudes about higher education and the increases in participation over the past 40 years (Thomas and Quinn, 2007).

This particular study, undertaken as part of a larger institution-wide research programme, set out to find out whether the factors influencing first-generation students to attend university, and their experiences of HE, differ from those of their peers whose families

have a more established history of participation in university. The study took place in a modern university in the UK. The university was one of those created from former polytechnics and other institutions under the 1992 Further and Education Act, commonly known in the UK as 'post '92' universities. The focus on first- and second-generation students arose, in part, following review of institutional attrition data that suggested that attrition rates were higher among first-year first-in-family students. While there are many support structures in place for students within the university, at the time of this research, first-generation students were not a priority for WP activity in the university's fair access agreement or mission.

### ***Influence of background on university participation***

Our study takes place in the particular local and national context of a modern university in the UK. However, the different social, economic and educational contexts of widening participation at a global level inform and can be informed by localised studies.

Much has been written about how cultural and socio-economic background impacts on student participation in HE, both in the UK and internationally (Archer et al., 2007; Reay et al., 2005; Loveday, 2015; Adnet, 2015). Particular emphasis in this paper is placed on comparing university applicants who are the first or subsequent generation of their family to attend university.

A review carried out by The Sutton Trust (2008) suggested that first-generation students' aspirations to go to university develop much later (age 15-16) than those whose parents were university educated and who perceive university as a 'natural next step' (The Sutton Trust, 2008, p. 29). As Purcell and colleagues (2008) report, around 40% of second-generation university applicants state that their parents encouraged them to go to university compared to around 25% of first-generation applicants. This is supported in other studies (for example, Porter et al., 1982 and Andres and Looker, 2001), which also found that students whose parents are university educated are more likely to go to university. A UK Department for Education (DfE, 2011, p. 14) report derived from two longitudinal studies corroborates this view, establishing that students whose parents have a degree are more likely to go to university (68%) than someone whose parents have qualifications below that of A-level (28%).

### ***Influences and support in applying to university***

The research surrounding WP has also focused on the information, advice and guidance available to support application to university (McVitty and Morris, 2012; Moore et al., 2013). Those who come from WP backgrounds require greater help and advice in accessing information and increasing levels of awareness of university options (Tinklin et al., 2004). Jones (2012), for example, recognises that good state schools and colleges assist students to apply for places at leading universities but posits that, in general, children at these schools receive less help in writing their university applications compared with children in fee-paying schools, a finding echoed by The Sutton Trust report (2008). Irrespective of the type of schooling, however, Purcell and colleagues (2008) argue that second-generation applicants, regardless of other background markers, are likely to benefit from support and information provided by their parents.

### ***Student retention and attainment***

Parental education has been described as key to promoting successful application, admission and transition to university (Allen, 1999). Once students start university, induction is particularly important for first-generation students (Thomas, 2011). Research suggests that first-generation students benefit from informal interaction with other students and for those

who might have doubts on whether to stay at university, the ‘support from friends and family’ is a main reason for them staying (Foster et al., 2011, p. 15; Stuart, 2006).

The Sutton Trust (2008) highlights a gap in educational attainment for children between the highest and lowest socio-economic groups and posit that this gap is significant even before schooling begins (see also McKnight, 2015). In a review of the literature about the impact of parental education on children’s academic attainment at school, Feinstein and colleagues (2004) identify a number of variables including the neighbourhood in which children live, the pre-school opportunities available, family size, the number of parents involved in the upbringing of the children, as well as parental beliefs and income that will impact on a child’s academic success. Their review suggests that a child’s education is impacted upon positively when their parents have been educated up to, but not necessarily including, tertiary level. As parental education is likely to affect income, it is something which shapes all areas of a child’s life, from the choice of toys, books and other resources to trips and out of school activities, all of which could have a positive educational and personal developmental value for their children (Ermisch and Pronzato 2010; Sammons et al., 2014).

This research sought to examine whether there is a difference in the influences on, experience and attainment of first-generation university students and those whose parents attended university. The focus on first- and second-generation students arose from previous analysis of institution-wide data that showed attrition was greater for first-generation students and that the specific university has a high proportion of students who are first generation, compared to comparable institutions. The research is a collaborative project between the university’s students’ union, staff involved in WP practice and the research team.

## **Methods**

This study aimed to explore whether there is a difference in first- and second-generation university students’

- degree outcomes
- perceptions of what and who influenced them to attend HE
- rating of their student experience.

The research approach consisted of analysis of final degree attainment data and a hard-copy survey given to all members of the population. The population included all final-year students in design and engineering programmes (N=132). This population was selected as it was possible to distribute the survey to all members of the population towards the end of their degrees and also to extract data about attainment for the same population.

### ***Attainment data***

For the cohort of students under consideration, examination board data were extracted that included degree classification, gender and age of the students as well as any WP ‘flags’ (such as ethnicity, low-participation neighbourhood). To maintain the anonymity of the students, any data fields that could identify individual students were removed.

### ***Survey design***

The survey was designed collaboratively by the research team, PhD students, the students’ union and professional service staff that work within the area of WP. The survey consisted of sections about influences on applying to HE, theoretically-derived Likert-type questions about student experience (including student satisfaction, level of engagement, belonging and sense of inclusion) and demographics, which included WP markers (such as indicators of socio-economic group, disability, lower participation neighbourhood and first in family) and protected characteristics (such as gender and sexual orientation).

In line with the tailored design method (Dillman, 2000) the questionnaire began with questions directly associated with student experience, followed by questions about motivation to attend university and concluded with demographic questions.

### ***Sampling***

The survey was given in paper copy to all design and engineering students during a showcase of their final work by a member of academic staff, a researcher and student volunteers. Ethical permission for the research was gained from the university Ethics committee.

### ***Data analysis***

With data limited to a single student cohort, it was possible to carry out a manual analysis of responses. All information was input into a spread sheet including full transcription of open-ended questions. Descriptive statistics were undertaken in the first instance to understand responses from the whole cohort. Responses were then filtered by whether the student was first or second generation in university. Inferential statistics ( $\chi^2$  tests) were used to assess whether any differences in responses between first- and second-generation students were significant.

## **Findings**

### ***Demographics***

The population for this research consisted of 132 final-year undergraduate degree students studying design and engineering programmes at a university in the south of England. The wider demographics of this population, as derived from the examination board data are indicated in Table 1.

Table 1. Demographics of population.

	Number in population and %
Male	102 (77%)
White	113 (86%)
White British	91 (69%)
Black or Mixed Ethnicity	9 (7%)
Mature students (over 21 years old)	5 (4%)
Leavers of State Schools	124 (94%)
Registered as having a disability	34 (26%)
Known to be first generation	25 (19%)
Known to be second generation	44 (33%)

The survey was collected from 59.8% (n=79) of the cohort and the data indicates a range of socio-economic backgrounds. 23% (n=30) of the sample were women which, while not representative of the university population as a whole, is higher than would be typically drawn from design and engineering subjects (Smith, 2011) and is broadly similar to the population demographics. When responses to the range of socio-economic questions in the survey were compared to information about the population as a whole – extracted from the examination board data – it was evident that the survey sample was broadly representative of the population as a whole.

The analysis of the examination board data for the entire cohort indicated that two thirds of students (66.67%, N=88) gained either a first-class or upper second-class honours degree (*see note at end of paper for an explanation of the UK degree classifications*), with

70% (N=21) of women slightly outperforming their male counterparts, since two thirds of men (65.68%, N= 72) gained these higher degree classifications.

While just 2% of the survey's respondents did not disclose whether they were the first generation of their family to go to university, the examination board data provided very limited information with 48% of entries having no reference to parental education.

### ***Influences on the decision to go to university***

The survey asked students to rate the extent to which a variety of factors influenced their decision to attend university. For the sample as a whole (see Table 2), the most important influence on the decision revolved around developing new skills and experiences, for a future career and getting a good degree. Closely following these influences, students also ranked highly the desire to have a good time and enjoy themselves. An individual's need to make new friends and to get a graduate job was also seen as very important, scoring almost as highly. However, making new friends was considered less important than getting a graduate job since fewer respondents identified that it was a factor that had *influenced them a lot*.

When the sample is disaggregated into responses from those who are first-generation and those who are second- or subsequent-generation students, some key differences emerge. Table 2 shows the rating of factors, with those rated most differently at the top. The largest differences between the two groups are therefore that the second-generation students were significantly more influenced by family expectations that they would attend university. While not statistically significant, second-generation students seemed to be more likely to state that the social reasons (to have a good time and enjoy myself; to make friends) influenced them to attend university than the first-generation students. Other factors, such as the desire for a good degree, graduate job and learning new information were not rated differently between the two groups.

Table 2. Influences on decision to go to university.

Why did you want to come to university:	First-generation students (A)	Second-and subsequent generation students (B)	Difference in percentage points between (A and B)	$\chi^2$
My family expected that I would go to university	40%	73%	33%	7.97*
To have a good time and enjoy myself	85%	97%	12%	2.63
To make friends	85%	97%	12%	2.63
My friends were going to university	45%	57%	12%	1.05
To build good networks for the future	81%	90%	9%	1.17
To get a graduate job	89%	83%	6%	0.899
To get a good degree	96%	100%	4%	1.31
To develop specific skills and experience for my career	96%	100%	4%	1.31
I wanted something more from my life	92%	87%	4%	0.457
Teachers at school expected that I would go to university	47%	50%	3%	0.743



To learn about something new	98%	97%	1%	0.05
I need a degree for my chosen career	98%	90%	1%	0.105

All  $\chi^2$  1 degree of freedom. First-generation students  $n=47$ . Second-generation Students  $n=30$

\* $p < .05$

As presented in Table 2, the key similarities in what influences both of these groups appear to be the desire for a graduate job and getting a good degree. School teachers are clearly influential in persuading a young person to decide whether or not to go to university (Moogan, 2011). Our research suggests that this influence persists across first- and second-generation students, as around 50% of each group of respondents reported their teachers had a role. There was, however, much greater variation in the expectations of the students' parents. Almost three quarters of the second-generation students commented that their family had expected them to go to university compared to around 40% of the parents of the first-generation students. Despite the relatively small sample size, the difference between how first and second generations rated the influence of family was found to be statistically significant.

The influence of school friends was also seen as a factor in decision making. Almost a fifth more second-generation than first-generation students reported that having friends who intended to go to university had influenced them. This, however, was not found to be a significant difference. Trends were found in the desire to make friends and have a good time, which was more likely to be described by second-generation students.

In summary, whilst first- and subsequent-generation HE students' decisions to attend HE are influenced by the desire to gain graduate employment and develop those skills required for graduate employment, a difference is observable in the social influencers both in terms of *who* influences an individual to go to university and also the *expected social networks* or friends gained from attending HE.

### ***Student experience***

The survey also asked students to rate the extent that they agreed with a range of statements relating to their experiences drawn from previous research undertaken by the students' union in the university and other research about influencers on student experience.

In terms of satisfaction with the overall university experience, for most questions both groups rated their experience similarly. Both first- and second-generation students broadly agreed with the statements that they felt that they belonged and felt included within the institution, their class and social groups; however, a somewhat surprising finding that warrants further investigation is that the first-generation students reported a *higher sense of belonging* than those who are second generation, with 97% saying that they felt included in their programme of study compared to 83% of second- and subsequent-generation students. This is interesting because nurturing a sense of belonging has been found to be vital to supporting WP students to stay on and succeed in university (Thomas, 2012), and has been highlighted as a challenge for typically less advantaged groups.

The largest difference in terms of student engagement related to the extent to which students engaged in self-managed learning. Significantly more second-generation students (94%) reported that they undertake self-managed learning than their first-generation peers (72%). A possible explanation for this is that second-generation students typically have greater academic preparedness, are better at managing their time and have acquired more developed independent study skills – factors that are associated with student success (Gazeley and Aynsley, 2012). However, the degree attainment data showed that first-generation students performed slightly better with just over three quarters (76%) of these students

gaining a first-class or two-one honours degree compared to 72% of second-generation students achieving these grades.

## Discussion

This research compared degree attainment data for all students in a cluster of related degree programmes with survey results. With the survey response rate of 60% and broadly similar demographics in the sample as the whole population, these results are considered to be representative of the final-year students in these programmes. As the survey was carried out with a very specific (and arguably small) population, statistically significant differences were not anticipated. However, a significant difference was found in how students rated the influence of family on their decision to attend HE. Our analysis also shows trends suggesting that first-generation students may be *less* motivated by social factors. First-generation students achieved marginally higher degree outcomes than their peers.

Many of the findings of this study are familiar to those working in English - and indeed international - WP research, practice and policy, and reinforce some of the arguments from the wider literature that surrounds access to HE. For example, second-generation students experience more family support and there are expectations to attend university at a younger age (The Sutton Trust, 2008). Indeed, the starkest difference in the results relates to who influenced students as to whether or not to attend university. While it is not surprising that there seems to be very little difference in the extent to which teachers influenced students to attend university, the difference of note, here, is the familial influence. We see 73% of second-generation students being influenced by family to attend HE, yet this drops to 40% of first-generation students. Similarly, a higher proportion of second-generation students were reported that their friends attending university influenced their decision to apply.

In England, government policy has led to changes in the way careers services are delivered. Careers services moved from the responsibility of local authorities to a structure where schools have a statutory duty to provide independent careers advice and guidance (DfE, 2013). In addition to the services now provided, young people also value informal approaches including the advice from their parents (BIS, 2012; Moogan, 2011). Following a reduction in statutory careers information, research by Collins and Cash (2014) in the same location found that parents felt ill-equipped to support their children with decisions about careers or about going to university. Although we know how parental education impacts upon support for children's education at school level, it is not known whether parental influence continues during a student's experience at university (Ermisch and Pronzato 2010; Foskett and Johnson, 2010; Harris and Goodall, 2008; Sammons et al., 2014; The Sutton Trust, 2008; Thomas and Quinn, 2007). This research focus on parental education and familial support in compulsory education could be opened up to investigate in more detail the influence of family or friends in terms of the different levels and types of support they might provide during an individual's post-compulsory education.

A key influence for both first- and second-generation students on the decision to attend university was to get a good degree. Given increased levels of graduate debt and the relationship between degree outcomes and employment, it is not surprising that this weighs heavily on students' minds (deVries, 2014; McGuigan et al., 2012). However, the data reported in this article also indicates that for second-generation students the social and networking aspects of university, including having a good time, are rated as equally important in influencing students to apply. This is not the case for first-generation students who, in addition to wanting to get a good degree, place more emphasis on getting a graduate job. This suggests that second-generation students could be more motivated by the aspects of university associated with social capital and socialised relationships, reaffirming the

importance of 'hereditary transmission' outlined by Bourdieu (Bourdieu, 1977; 1986; Bourdieu and Passeron, 1990; Coleman and Hoffer, 1987).

One paradox in our findings is that first-generation students reported doing less of the self-managed learning or independent study for their programme than their second-generation peers, yet, based on the data from the examination results, performed better. We have no explanation for this and suggest that perceptions of what 'needs to be done' as perceived by different students would be worth further research. Could it be that the social capital and expectations of the second generation students created a perception that they were doing *enough* whereas the first-generation students felt that they could always be doing more work?

A sense of belonging, in particular belonging to an academic community, has been described as crucial to the successful retention of students (Thomas, 2012). There was very little difference in the extent to which the first- and second-generation students rated their feelings of inclusion and belonging in their academic programme, their class group and the university as a whole. Indeed, first-generation students rated these questions more positively than second-generation students. This is a remarkably positive finding for the institution concerned as the literature attests to how students from WP backgrounds typically have a lower sense of belonging.

The students surveyed were final-year students at the end of their degree programme and therefore had successfully been retained by the institution. In another aspect of the larger research study, reported separately, interim data suggests that attrition of first-generation students was higher than for any other group of students with or without other WP markers (author retracted). It is possible that the first-generation students in this study have demonstrated a particular form of resilience, not only to remain in university but also to perform better than their peers in terms of degree outcomes. To explore this as a possible explanation, an investigation of the difference between those 'first in family' students who withdraw and those who remain, particularly in terms of resilience and sense of belonging, would contribute to the body of knowledge.

Although this study was limited to final-year design and engineering students, the response rate to the survey of 60% was considered relatively high, particularly when compared to other studies with an average response rate of less than 53% (Baruch and Holtom, 2008). As a study which explored the differences between how first and second generations valued different influencers and experiences, familial support was found to be statistically significant. It is recognised that using surveys at the end of the degree programme has inherent limitations, particularly when evaluating reasons for applying to university; nevertheless, the insights drawn from this work are likely to inform future research and raise further questions about the experiences of first-generation university students.

## **Conclusions**

The literature reminds us that disadvantaged and under-represented groups rely more heavily on less formal sources of support to help them decide to go to university (Foskett and Johnson, 2010; McGuigan et al., 2012). The current study reiterated this: family had a greater influence on the decision to go to university for second-generation students and the desire for the more social and socialised aspects of HE ("to have a good time and enjoy themselves") was similarly ranked to wanting to learn something new or getting a good degree. The dynamic for first-generation students, on the other hand, placed less emphasis on social interaction as a reason for going to university and focused more on degree attainment and graduate employment. Here we see an apparent division between how different groups of students perceive HE. For second-generation students university is often seen a continuum of their social and cultural life, whereas for first-generation students participation is outcomes

focused. From an academic perspective this seems commendable, but we should remember that degree attainment is only one outcome of a university education.

It seems that second-generation students are more likely to see the benefits that emerge from the interaction with others and it is this social capital that aggregates into a durable network of relationships that can be called upon during their working and personal lives. In his work on social capital (1986), Bourdieu likens this to an investment strategy, a sort of deferred payment that can be called upon, including - as we have seen - as a potential inheritance. Whilst compulsory schooling will often bring children together and may influence aspirations to attend university, the importance of established familial university experiences and relationships for second-generation students cannot be underestimated. A challenge for universities, schools and government, therefore, would be to consider how to build, nurture and transmit these social capital bonds beyond the family or kinship setting.

This study has also identified that the experience of HE is different for first- and second-generation students. Less than three quarters of first-generation students who responded engaged with the independent learning tasks set for them compared to the engagement of almost all of the second-generation students. We argue that this supports the literature that identifies second-generation students as having greater academic preparedness, confidence and capital. Reducing this difference sets a challenge to all those working towards WP to HE in England. The sector needs to work together to develop and implement sustainable pre-entry interventions to enhance independent learning skills as well as fostering an enhanced sense of academic confidence.

The degree classification data for this cohort of students shows that first-generation students performed slightly better than their second-generation counterparts in terms of degree classification outcome. This could suggest that this cohort of students have bucked a national trend and, for the university concerned, this might be potentially encouraging in terms of supporting WP. It may actually be a more generalised finding across the sector. It is possible, however, that the attrition rate of first-generation students will have been higher, leaving proportionally a greater number of academically resilient first-generation students in the final year.

Compared to the number of studies that have explored attainment of disadvantaged groups during primary and secondary education, the number of comparative research projects in HE is small. To understand how commonplace our finding is, it would be useful for wider research to include a multi-site project of institutions with different student populations and academic missions, to consider the experience of first-generation students and their attainment at particular punctuation points during their university studies.

This article contributes to debates surrounding the reasons WP students decide to go to university, and to understand more fully their experiences whilst at university. It should be helpful in providing direction for future policy and research initiatives and will be of interest to senior HEI managers and recruitment leads, who are responsible for decisions regarding their institutions' own investment in WP.

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## **Disclosure statement**

No conflicts of interest are declared.

## Notes

British undergraduate degrees are awarded either with or without honours. A candidate's overall performance determines their final degree classification. The degrees that can be awarded are First-class honours (1<sup>st</sup>), Second-class honours – upper division (2i or two-one), Second-class honours – lower division (2ii or two-two), Third-class honours (3<sup>rd</sup>), Ordinary degree (pass).

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